DOCUMENT RESUME

ED 258 655 JC 850 370

AUTHOR Robertson, Lyle R.
TITLE Emerging Technologies Consortium. Implications for Community Colleges of a Survey of Michigan Technology Users and Producers.
PUB DATE Apr 85
NOTE 13p.; Paper presented at the Annual National Convention of the American Association of Community and Junior Colleges (65th, San Diego, CA, April 14-17, 1985).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Community Colleges; *Demand Occupations; *Educational Needs; *Employer Attitudes; *Employment Projections; *Job Skills; State Surveys; *Technological Advancement; Two Year Colleges

ABSTRACT

An employer survey was conducted by the Emerging Technologies Consortium to assess changes in the workplace and their implications for the delivery of community college educational services. Over 100 business firms in Michigan were contacted to obtain employers' views on their current use of technology, changing employment qualifications, employment projections, and their assessment of the future. Major findings included the following: (1) 70% of the company representatives interviewed expected employment in their firms to grow over the coming years; (2) three of every four durable manufacturing firms were using computer-assisted design, and half of the durable and two-thirds of the non-durable manufacturers were using computer-assisted manufacturing processes; (3) 73% of the respondents expected professional staff to increase, 65% expected increases in technicians, 63% expected increases in the need for skilled craftspersons; (4) 39% of all firms expected decreases in the need for production workers, 18% predicted a lower need for clerical staff, and 11% envisioned decreases in supervisory and managerial staff; (5) interpersonal and communication skills were seen as a top priority for employees; and (6) three out of ten respondents were involved in providing technology update for faculty. Appendices include information on the study sample, employment projections, and expected personnel shortages by technology users. (HB)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED258655

EMERGING TECHNOLOGIES CONSORTIUM

IMPLICATIONS FOR COMMUNITY COLLEGES OF A SURVEY OF MICHIGAN TECHNOLOGY USERS AND PRODUCERS

by

Lyle R. Robertson
Provost
Macomb Community College
Mt. Clemens, Michigan

Paper presented at the
65th Annual National Convention of the
American Association of Community and Junior Colleges

San Diego, California
April 14-17, 1985

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

L.R. Robertson

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☒ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

JC 850 370

EMERGING TECHNOLOGIES CONSORTIUM

IMPLICATIONS FOR COMMUNITY COLLEGES of a SURVEY OF MICHIGAN TECHNOLOGY USERS AND PRODUCERS

by Lyle R. Robertson, Provost, Macomb Community College, Warren, MI

Michigan community colleges are aware that vast changes are occurring in the workplaces from which they draw their students and to which they send them. The dimensions of these changes and their implications for the delivery of community college educational services were the focus of the employer survey conducted by the Emerging Technologies Consortium, made up of Lansing, Macomb, Oakland and Wayne County Community Colleges.

Over 100 business firms in durable and nondurable manufacturing, retail trade, telecommunications, health, financial, legal and business services provided extensive opportunities for face to face interviews concerning current use of technology, changing employemnt qualifications, employment projections, and a general view of the future. Specific information was gathered on office automation, telecommunications, computer-aided design, laser, materials management, quality control, computer-assisted manufacturing and home health care.

The recent Commerce Department Task Force on Long Range Economic Strategy concluded that there were no "quick fixes" for Michigan's economy. As Doug Ross, a task force member, stated at a recent luncheon, Michigan has three basic options for economic development:

GET POOR: that is, reduce our standard of living to compete with the Sunbelt on wages and cost of doing business;

GET OUT: that is, attempt to attract new high technology firms and let our existing "smokestack" industries go by the board.

GET SMART: that is, build on the base we have by not only upgrading plant, processes and equipment but also by focussing major renewal on our human capital: our current and future workforce.

The following few pages summarize the main directions of change identified by Michigan businesses. None of them are startling or unique. Community college people already discuss these issues extensively. Almost every community college can probably identify one or more activities currently underway to address these issues. In these pages, Michigan business and industry also define several directions they believe community colleges need to consider as an essential part of this human capital development effort. You and your colleagues must decide how you will respond. Through your acts of commission or omission will Michigan get poor, get out, or get smart?

EMERGING TECHNOLOGIES CONSORTIUM

WHAT EMPLOYERS SAID

MICHIGAN TECHNOLOGY USERS AND PRODUCERS ARE POSITIVE ABOUT THE FUTURE.

Seventy percent of the firms interviewed expect employment in their firms to grow over the next few years.

Only nine percent predict an overall decrease in employment over the next few years.

AUTOMATION TECHNOLOGIES ARE BEING USED BY FIRMS OF ALL SIZES AND IN ALL ECONOMIC SECTORS.

Office automation, from simple automated payroll services used by the smallest firms to virtually "paperless" offices in the sophisticated service firms, affects 6 of every 10 business concerns.

Telecommunication technologies are almost as pervasive with even 50% of the smallest firms using advanced systems.

Three of every 4 durable manufacturing firms currently use computer-assisted design.

Half of the durable and two-thirds of the nondurable manufacturers use computer-assisted manufacturing processes.

The same percentages are involved in formal quality control programs.

Two of every 3 nondurable manufacturers and retail trade firms use materials management systems. Overall, nearly 30% of all firms have such systems.

Only laser technology is not used by a significant proportion of the firms surveyed.

EMPLOYERS EXPECT TECHNOLOGY USE TO HAVE DIFFERENTIAL EFFECT ON CATEGORIES OF EMPLOYMENT.

Overall, 73% of firms interviewed expect professional staff to increase:

63% of manufacturers expect increases;
80% of business service firms expect increases;
85% of telecommunications firms expect increases.

Overall, 65% of firms interviewed expect increases in technicians:

63% of manufacturers;
70% of high technology producers;
45% of business services firms;
70% of telecommunications firms.

Overall, 63% of firms interviewed expect increases in skilled craftspersons:

50% of manufacturers and high technology producers;
20% of business services firms;
12.5% of retail trade;
10% of telecommunications firms.

IN CONTRAST

Overall, 39% of all firms expect decreases in production workers:

34% of manufacturers;
11% of high technology producers.

Overall, 18% of all firms expect decreases in clerical staff:

18% of manufacturers;
22% of high technology producers;
25% of business services firms.

Overall, 11% of all firms expect decreases in supervisory and managerial staffs:

10% of manufacturers;
17% of high technology producers;
15% of business services firms;
10% of telecommunications firms.

THE TECHNOLOGIES ARE ALL INTERRELATED.

Employers and producers believe voice (telephony) and data processing systems will be totaly merged by 1990, if not sooner.

Great efforts are being expended to develop communication protocols allowing office, design and manufacturing systems to interact.

Employer expectations are that workers and managers at all levels will understand the basic processes and functions of the total organization.

Jobs, with or without title changes, are being upgraded not deskilled. Even in the firms with the most restricting labor contracts, the evidence is that job functions are being broadened. The day of the narrowly defined job is over, as even production work is turning into a controlling, supervising, problem-solving function.

TRADITIONAL, VERTICALLY-INTEGRATED, HIERARCHICAL ORGANIZATIONS ARE STRUGGLING TO REDESIGN CORPORATE STRUCTURE INTO MORE HORIZONTAL, NETWORKING ORGANIZATIONS.

Improved interpersonal and communication skills are top priority needs for employers.

Expectations of knowledge of systems and system analysis are evident in employer requirements for workers at every level.

Exploration of automation technologies are clearly forcing business to deal with the "holistic" character of the workplace.

"Crosstraining" is the key concept for employers as an avenue to reduce dislocation of current workers and as a requirement for new workers.

THE "BASIC SKILLS" ARE MUCH MORE THAN THE 3 "R's".

There is widespread frustration with a perceived lack of employability skills: attendance, promptness, effort, and willingness to work. Employers agree with national reports that these skills are more important than specific occupational skills.

Fundamental reading, writing, speaking and computational skills are also more prized than occupational skills.

The "new" fundamental skill is technical literacy: understanding basic uses and functions of computers and automation; keyboard skills; familiarity with common software, data bases, and networks; basic manufacturing materials and processes; statistics; and analytical, problem-solving skills.

EMPLOYERS ARE OF TWO MINDS CONCERNING WHAT SPECIFIC SKILLS ARE NEEDED TO WORK WITH THE NEW TECHNOLOGIES.

Requirements now often resemble a desire for "Superman".

Basic occupational knowledge and skill are still highly prized: machining, tool, die and fixture/jig building, welding, mechanics, electrical/electronic knowledge.

Employers basically believe they can and should train a person to use technology; they would rather not teach basic skills.

The major constants in all descriptions of job requirements are basic skills, technical literacy, systems understanding, and analytical ability.

EMPLOYERS ARE WILLING, IN GENERAL, TO TALK TO AND WORK WITH COMMUNITY COLLEGES, BUT THEY HARBOR WIDESPREAD PERCEPTIONS THAT COMMUNITY COLLEGES ARE SO ENTRENCHED IN THEIR OWN RIGIDITIES THAT THEY CANNOT AND WILL NOT RESPOND TO BUSINESS NEEDS.

Three out of every 10 firms state they are currently involved in providing opportunities for technology update for faculty. Five of every 10 are willing to discuss additional opportunities.

Substantial numbers are involved in cooperative education and apprenticeship programs. Many use community college for assessment of employees who are being considered for advancement. Over 40% of CAD users provide student training opportunities; for other technologies 5-15% of users provide such opportunities.

Complaints abound concerning course and class scheduling: reliance on semester/term; unvarying blocks of time; limited number of offerings per year. Business prefers schedules that consider what can be accomplished in one day or one week. They want a variety of options to fit different schedules, so that employees can finish a two year program in something less than 4-6 years.

Employers are concerned that open admissions and lack of career guidance permit too many people who are basically unsuited for a particular career to pursue that career. They expect more assessment and guidance to help people select appropriate career goals. Employees who are unsuited by ability or temperament for a particular job cost employers money in turnover and poor performance; they want help in minimizing these costs.

Equally frustrating are perceptions that community colleges seek to maximize student numbers at the expense of sufficient skill development opportunities. There is great scepticism that community college graduates can demonstrate the skill levels which the colleges and programs claim.

In two major areas, computer programming and computer-assisted design, there is substantial feeling that the field is moving beyond the capacity of the two year program to produce people with even the minimal entry level skills. Employers express a growing expectation that community colleges actively push the development of formal articulation agreements with senior level colleges and work with students to understand that employment in these areas will require a commitment to continue to the upper level institution.

WHAT EMPLOYERS WANT COMMUNITY COLLEGES TO DO

EMPLOYERS WANT COMMUNITY COLLEGES TO:

MOVE TOWARD PROVIDING MORE COORDINATED AND INTEGRATIVE PROGRAMS, BASED ON DEVELOPING THE FUNDAMENTAL KNOWLEDGE AND SKILL FOR GROUPS OF OCCUPATIONS THROUGH USE OF CORE CURRICULA OR COMMON PREREQUISITES, WITH OPTIONS FOR SPECIALIZATION TO DEVELOP SPECIFIC OCCUPATIONAL SKILLS.

INCLUDE EXPERIENCES TO DEVELOP A SOLID FOUNDATION IN THE BASIC COMMUNICATION, COMPUTATION, INTERPERSONAL/GROUP AND ANALYTICAL SKILLS IN ALL OCCUPATIONAL PROGRAMS.

RECONSIDER THE EXISTING BALANCE BETWEEN THE NUMBER OF STUDENTS ADMITTED TO A PROGRAM, AVAILABILITY OF EQUIPMENT FOR SKILL DEVELOPMENT, AND TIME REQUIRED TO REACH MINIMALLY ACCEPTABLE SKILL LEVELS.

RECONSIDER THE CONTACT/CREDIT HOUR METHOD OF DETERMINING COURSE AND CREDIT COMPOSITION TO INCREASE THE RANGE OF COURSES AND SCHEDULES AVAILABLE TO STUDENTS.

BE THE MAJOR ACTOR IN PROPOSING AND ADVOCATING ARTICULATION AGREEMENTS WITH SENIOR INSTITUTIONS AND, WHERE FEASIBLE, SECONDARY LEVEL INSTITUTIONS.

EXAMINE THE BALANCE BETWEEN THEIR COMMITMENT TO OPEN ADMISSIONS AND EQUALITY OF ACCESS AND THE NEED TO HELP STUDENTS MAKE CAREER CHOICES WHICH PROVIDE PERSONAL AS WELL AS MONETARY REWARDS, AND AVOID SELECTIONS WHICH WILL BE ULTIMATELY SELF-DEFEATING.

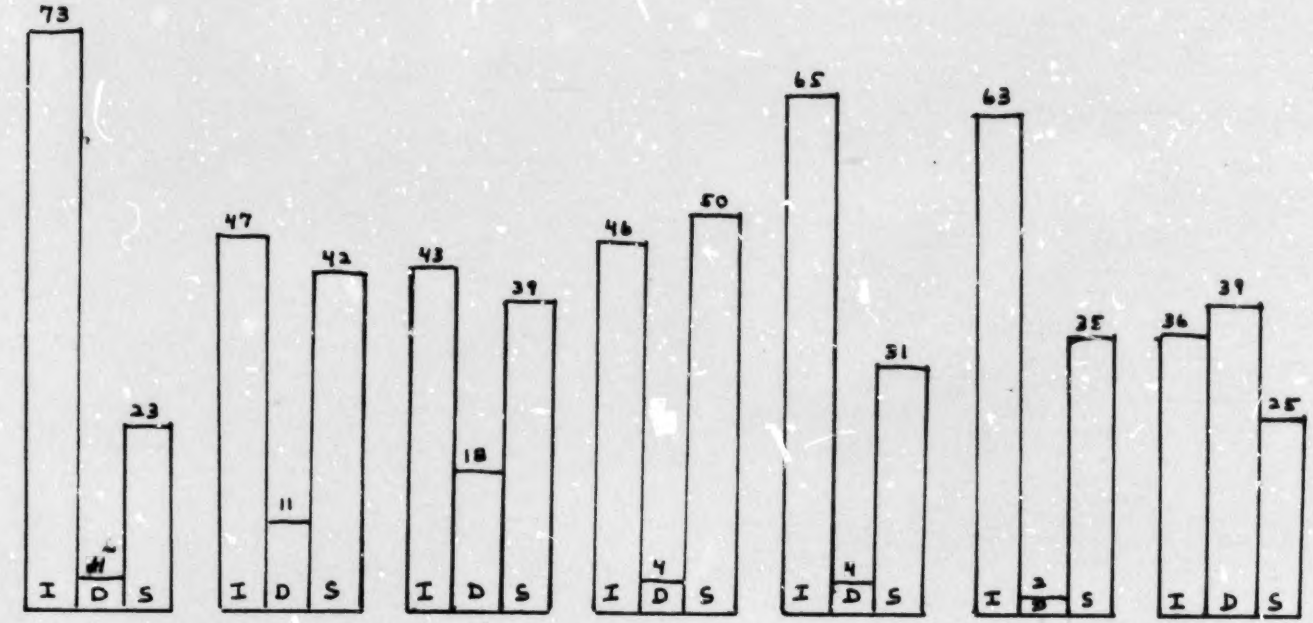
NUMBER OF FIRMS BY SIZE

FIRM SIZE	NUMBER
1 - 99	20
100 - 499	44
500 - 999	14
1000 +	19
	97

EXPECTED PERSONNEL SHORTAGES BY TECHNOLOGY USERS

SECTOR	ELECTRONIC OFFICE N - 58	TELCOM N - 37	C A D N - 30	QUALITY CONTROL N - 22	MATERIALS MANAGEMENT N - 25	C I M N - 21
MANUFACTURING						
DURABLE	5.2	2.7	73.3	45.5	8.0	52.4
NONDURABLE	1.7	5.4	0.0	0.0	0.0	0.0
SERVICE						
HEALTH	1.7	-	-	-	0.0	-
TELECOM	3.4	13.5	-	-	0.0	-
RETAIL TRADE	3.4	2.7	0.0	-	0.0	0.0
FINANCE/BUS	20.8	13.5	10.0	4.5	4.0	-
	36.2	37.8	83.3	50.0	12.0	52.4

EMPLOYMENT PROJECTIONS BY PERCENT OF TOTAL AND CATEGORY OF WORKER



KEY: I - INCREASE D - DECREASE S - STAY THE SAME

ERIC Clearinghouse for Junior Colleges
AUG 16 1985